Enhancing Strategic IT Alignment through Common Language: Using the Terminology of the Resource-based View or the Capability-based View?

Research-in-Progress

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Abstract

Despite all the studies on alignment in the past 30 years, alignment is still CIOs' top concern, denoting the lack of prescriptive studies on antecedents of alignment. Particularly, shared language between CIO and top management team is one of the most important yet neglected antecedent of alignment. While previous studies suggest CIOs avoid technical language and use business terminologies, they do not provide further details. The purpose of this study is to prescribe guidance for CIOs regarding the terminologies that should be used in a conversation with the top management team. Leveraging the literature on strategic management, we suggest CIOs apply the nomenclature of theories of Resource-based View or Capability-base View instead of technical jargons. Moreover, using the Semantic Memory Theory, we hypothesized that applying the nomenclature of Capability-based View results in higher top managers' understanding of the role of IT. An experiment is suggested to evaluate the hypotheses.

Keywords: Shared Language, Shared Understanding, Strategic IT Alignment, Capability-based View, Resource-based View, Semantic Memory, IT Competence

Introduction

Despite all the efforts that have gone into studying IT-Business alignment in the past 30 years, alignment is still the top concern of CIOs based on a recent international survey by the Society for Information Management (Derksen & Luftman, 2014). Alignment is a moving target (Chan & Reich, 2007; Venkatraman & Henderson, 1993; Tallon, 2008; Baker et al., 2011). Either business is changing and information systems (ISs) have to adapt to remain in alignment with the evolving organizations' needs, goals, and strategies (Vessey & Ward, 2013), or new information technologies (ITs) emerge and business goals and strategies have to be revised to utilize the opportunity (of new products, services, relationships) (Venkatraman & Henderson, 1993) or avert business risks. The persistent ranking of alignment as the top concern suggests that CIOs feel that the challenges to the attainment of alignment have not been

overcome. It seems that CIOs keep having difficulty in improving some antecedents of the alignment in a timely manner.

An important antecedent of strategic alignment is the degree of commonality between languages and terminologies used by CIO and Top Management Team (TMT) (Karahanna & Preston, 2013; Preston & Karahanna, 2009). According to the literature, shared language enhances strategic alignment through improving shared understanding of the role of IS (Preston & Karahanna, 2009) and fostering trust between CIO and TMT (i.e. relational social capital) (Karahanna & Preston, 2013). Shared language is necessary for communicating meaning, convergence of opinions about situations, and knowledge exchange and integration, which allow the CIO and TMT to reach a consensus on the role of IS capabilities in achieving strategic goals (Karahanna & Preston, 2013; Johnson & Lederer 2005, Madhavan & Grover 1998, Nahapiet & Ghoshal 1998, Nelson & Cooprider 1996). Shared language also fosters trust between the CIO and TMT by creating a sense of familiarity, increasing transparency, and reducing perceptions that the CIO has a hidden agenda behind the use of technical language (Karahanna & Preston, 2013). All in all, communication is more effective when a shared language exist (Selten & Warglien, 2007; Charaf et al., 2013).

To enhance shared language, literature suggests CIOs avoid using technical, IT jargon when interacting with TMT members and use business terminology instead (Reich and Benbasat, 2000; Preston & Karahanna, 2009; Karahanna & Preston, 2013). But, there are many terminologies that can be applied by CIOs. The question is what business terms should be utilized and why? The alignment literature, however, is next to silent on an appropriate shared language (Jentsch & Beimborn, 2014), and few attempts have been made to establish such nomenclatures (i.e. classes of business terms). van der Zee & de Jong (1999), for instance, suggested developing the balance score card and visualize how IT affects performance measures of finance, customer, organization learning, and business process. TOGAF (The Open Group, 2011), an Enterprise Architecture framework, also suggested an artifact dubbed as Business Service/Function Catalog that consists of the following language concepts: organization unit, business function, business service, and information system service concepts. However, these attempts have not provided "why" (Whetten, 1989) those nomenclatures should be applied and why they are better than other nomenclatures including technical jargons. In fact, those attempts seem to be based mostly on inspired creativity and trial-and-error design processes rather than theoretical justification (Gregor & Hevner, 2013).

Therefore, there is room for significant research to provide theoretically and empirically supported prescriptions about *what terminology should be applied by CIOs in their communication with TMT members*. This paper aims at answering this question. Using the semantic memory theory, the notion of concept stability, and empirical strategic management studies on resource-based view, core competency, and dynamic capability, this paper will try to *compare their effectiveness in terms of their ability to create higher TMT members' understanding of the role of IT*. The result of the study is important in that not only it is helpful to CIOs to establish shared language in their communication, but it provides the justificatory knowledge, namely the kernel theory, for a design artifact (Gregor & Hevner, 2013) aiming at enhancing the strategic alignment. Such design artifact can be added to the enterprise architecture frameworks like TOGAF. Moreover, this paper tries to fill the void of a research paper in the alignment literature that investigates social alignment from the language point of view (Jentsch & Beimborn, 2014).

The rest of the paper is organized as follow. The next section provides the theoretical development and hypotheses. Then, an outline of the research methodology follows. The paper concludes with an answer to the research question and its theoretical and practical implication for researchers and CIOs.

Literature Review and Theoretical Development

Language and Semantic Network Theory

Habermas has conducted a profound investigation of language and communication. In his Theory of Communicative Action, Habermas (1985) explains how a consensus on a subject is reached through a dialogue. First the listener needs to understand the meaning of what is being claimed. This necessitates that the listener knows the language in use. Then, she needs to verify the validity of the claim and inform the partner if the claim is true or false. By confirming the validity of the claim, consensus about the

communication content is reached (Jentsch & Beimborn, 2014). Therefore if the verification can be accelerated, the consensus can be achieved faster.

The relationship between the speed of claim verification and the content of the claim has been studied in depth in several research studies by Collins and Quillian (1969, 1970a, 1970b), Anderson and Bower (1972), Rips et al. (1973), Collins and Loftus (1975), and Raaijmakers and Shiffrin (1981). The intersection of their ideas is that a human memory is a huge network of nodes interconnected by associations. For each word or term in a language, there exists a node in the memory of the individual who knows the language. Upon presentation of the word to an individual, the corresponding node in her memory will be activated, which then activates other related nodes.

Collins and Quillian (1969, 1970a, 1970b), in their Theory of Semantic Memory, provided empirical support that the nodes are organized in a semantic way. They have found that verification of the claim "canary is an animal" takes longer time than the claim "canary is a bird". Therefore, they concluded that the three nodes "canary, bird, animal" are stored in the form of canary -> bird -> animal in human memory, rather than in the form of canary -> bird and canary -> animal.

Rips et al. (1973) attributed the longer verification time to the longer semantic distance between the two nodes. They defined *semantic distance* of two nodes as the number of intermediate nodes exist in between the two nodes in a memory. According to the Theory of Semantic Distance, the verification time of a sentence claiming a truth has a negative correlation with the semantic distance of the corresponding nodes of the applied words. Therefore, comparing to "canary is a bird", the claim "canary is an animal" takes longer time because the semantic distance of "canary" and "animal" in a human memory, which is wired as "canary -> bird -> animal", is longer than the semantic distance between "canary" and "bird".

Verification can also be faster if the two words' corresponding nodes has a strong association (Collins and Loftus, 1975). According to Raaijmakers and Shiffrin (1981), the strength of the association between two nodes increases if the two words occupy the working memory simultaneously. Therefore, the more the two words appear concurrently in stimuli, their association becomes stronger. Since top managers are often dealing with their area of expertise (e.g. marketing, finance), the stimuli in their environments strengthen the associations among the words of the corresponding domain. Thus, these managers have a well-established network of domain-related words in their memory (see Figure 1).

In the case of a claim that contains two words with a long semantic distance (e.g. the distance between Hadoop and revenue in "Deploying Hadoop increases revenue"), we postulate that if the nodes in between are given in the claim, the verification will be faster. In other words, it is faster to recognize an intermediate word/node than to recall it. Our postulation is based on Postman et al. (1948)'s finding that recognition is generally superior to active recall. The reason can be attributed to the fact that recall is a two-step process including retrieval and recognition (Anderson & Bower, 1972) and thus slower.

To summarize, taking into account Habermas' explanation of consensus-formation, facilitating verification for the listener contributes to consensus achievement. Therefore, if the content of a claim can be modified to be verified fast, the consensus can be reached sooner. We postulate that this results in reaching consensus on a larger number of subjects during meetings, which improves the shared understanding of the two individuals.

Speaking in Technical Jargon

In this light, we can explain why speaking in technical jargons does not result in CIO-TMT's shared understanding of the role of IT. Consider the example of a CIO who wants to encourage TMT to invest in Hadoop. He says:

> Hadoop is schema-on-read, scalable, and fault-tolerant. Since it is schema-on-read, it can accept unstructured data as well as structured data. This helps us store whatever data we have and create a data lake. We can then apply data analytic techniques to extract unknown patterns from the data lake. In addition, it is scalable; therefore, if our data lake grows from terabytes to petabytes, it can still handle the data and no changes required. Moreover, Hadoop is fault-tolerant; that is if a hardware failure occurs during executing a command, we do not need to rerun the command. It has the copy of data on two other machines and it can simply use them.

And he thinks he is speaking in a simple language since he only mentioned the technical benefits of Hadoop and did not speak about the technical details. He could have started with:

> Hadoop is an open-source platforms that have been written in Java language. It consists of HDFS and MapReduce. HDFS is the storage layer and MapReduce is the processing layer. To utilize MapReduce, one needs to know Java. However, Hive is a technology built on Hadoop to accept SQL.

However, in a typical TMT members' memory, the corresponding nodes (e.g. fault-tolerant, scalable, and schema-on-read) do not exist. Even if they exist, there is no path that connects these nodes to the existing, well-established nodes (e.g. competitor, customer, sale amount). See Figure 1. Therefore, this claim cannot be verified by TMT members or takes a long time to be verified. The consequence of applying technical jargons frequently can be so frustrating for TMT members that they may lash out at CIOs and tell them to "come back when they can speak English!" (Austin et al., 2009, p. 125)

Therefore, the extant literature suggests that "CIOs use business terms in their conversation with TMT members". Translating this into the language of Semantic Memory Theory, it means "CIOs should use terms whose corresponding nodes exist in TMT members' memory and are connected to other established nodes". Similarly, the purpose of this study i.e. "finding business nomenclatures and comparing their effectiveness" can also be translated to "*finding nomenclatures whose corresponding nodes exist in TMT members' memory and comparing their semantic distance to the well-established nodes in their memory*".

In the following, we provide a literature review on the nomenclatures leveraged by researchers to understand, think, share, and discuss thoughts on organizations, strategies and competitive advantage. Particularly, the nomenclatures applied in theories that have attracted and used by many scholars of strategic management can be good candidates since they have demonstrated a high potential in sharing thoughts. We are assuming it is reasonable that CIOs apply the same nomenclatures in their dialogues to discuss IT plans, objectives, and strategies to achieve a higher shared understanding of the role of IT and thus higher strategic alignment.

It is worthwhile to note that since IT can be assumed as an internal source of competitive advantage, we only focus on the strategic management literature that addresses strategies and competitive advantages from internal point of view; we do not consider Industrial Organization's view (Bain; 1968; Porter, 1979; Porter, 1980; Porter, 1985) that explains the same issue using *external* sources (i.e. the structure of industry) (Kraaijenbrink et al., 2010). In this regard, two popular internal views of strategies have been found in the strategic management literature: the Resource-based View (RBV) and the Capability-based View (CBV). In the following, these two views and the nomenclatures they apply will be discussed in detail.

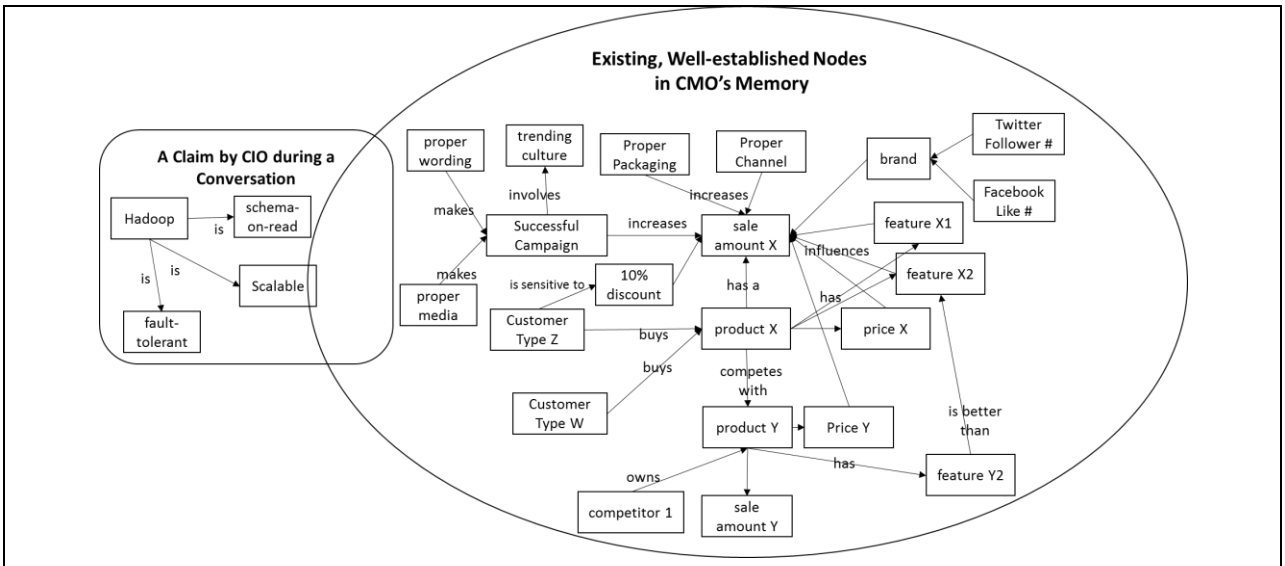

Figure 1- Memory of a typical CMO and a claim by CIO using technical jargons. The corresponding nodes

in the claim either do not exist or are not connected to well-established nodes in CMO's memory.

Resource-based View and its Terminology

Resource-based View (Barney, 1991; Barney, 1995) has been one of the most well-known, powerful theories for understanding organizations over the past two decades (Barney et al., 2011). It aspires to explain the reasons of differences in performance of firms in the same industry and their competitive advantages using the *internal* sources of a firm. RBV considers resources as a firm's significant component and view firms as a bundle of resources (Kraaijenbrink et al., 2010). Employing resource as the unit of analysis (Lockett et al., 2009), RBV suggests that controlling VRIN (valuable, rare, inimitable and non-substitutable) resources results in returns over and above the marginal producer, dubbed as rent (Ricardo, 1817; Seddon, 2014), and leads to sustainable competitive advantage (SCA) (Barney, 1991).

The RBV theory applies the following terminology: resource, value, rarity, imitability, and substitutability. Appropriability and mobility have also been mentioned as two other attributes of resource by some researchers (Wade & Hulland; 2004; Mata et al. 1995). To be able to investigate the terminology, we need to have a good grasp of the definition of them.

Despite its popularity, RBV suffers from its ambiguous definition of *resource* (Wade & Hulland, 2004; Kraaijenbrink et al., 2010; Seddon, 2014; Teece, 2009). While Barney in 1991 considered resource as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991a: 101), in 1995 he contradicts this by talking of "resources and capabilities" as if they are separate things (Seddon, 2014). The all-inclusive definition of resource is problematic as it drives the theory towards tautology and being non-falsifiable (Lado et al., 2006; Lockett et al., 2009; Kraaijenbrink et al., 2010), in that there is nothing strategically useful associated with the firm that is not a resource, and even SCA can be regarded as a resource (Kraaijenbrink et al., 2010). Moreover, this definition does not appropriately distinguish between resources that are inputs to the firm and capabilities that select, deploy, and organize such inputs (Kraaijenbrink et al., 2010). As for this study, we define resources as anything that can be valued by accountants *a priori* (Makadok, 2001) (e.g. employee, devices, machines, equipment, stocks, hardware, network infrastructure, software licenses) and can be used as inputs to firms' processes to create, produce, and/or offer goods or services to a market (Wade & Hulland, 2004).

According to Mata et al. (1995), the *value* of IT is either reducing organizations' costs of operations or increasing their revenues. According to Bowman & Ambrosini, 2000), this is the *use value* or the perception of value by the organization, which can be measured by the amount of money the organization is prepared to pay for the resource. However, there also exists an *exchange value* that is the price actually paid by the organization to own the resource. According to RBV, *rarity* refers to the degree competing firms possess the same resource. *Imitability* refers to the extent competitors can duplicate the resource. *Substitutability* refers to the degree other resources can be applied in place of the resource. *Mobility* refers to the extent the ownership of the resource can be poached by competitors. Finally, *appropriability* refers to the extent the firm can apply the resource and appropriate the returns.

Given RBV's elegant simplicity and its immediate face validity (Kraaijenbrink et al., 2010), the theory and its terminology have been applied by many scholars to share their thoughts on strategy and competitiveness. Thus, we postulate its terminology can also be adopted by CIOs to communicate the role of IT with TMT. In other words, CIOs can leverage on an IT resource as the focal concept and speak about the attributes of the resource (i.e. its VIRN-ness) to TMT members. Take the example of the role of big data and Hadoop in an organization. A CIO can claim:

> Hadoop is a new technology. [Value:] Deploying Hadoop increases our revenue by having competitive prices. [Rarity:] As far as I know, at the moment, none of our competitors are utilizing or deploying Hadoop. However, in a recent CIO conference, I noticed that a couple of our competitors like X and Y have started planning on deploying Hadoop. [Imitability:] It takes us a year to completely deploy Hadoop. As for our competitors like Z and Y, I assume it takes them a year and a half considering their inability to pay high enough to hire best experts in the market. [Substitutability:] There is another technology, called Spark, in the market. Although it is highly

> praised by experts for its speed, it is at the early stage of development and it can take three years to be mature to be deployed. [Value:] Hadoop will cost us up to $200K per year.

Since the RBV terminology consists of words whose corresponding nodes are well-established in TMT members' memory, the claims that use this terminology can be verified faster than claims that use technical jargons. Therefore, TMT members can appreciate the role of IT resources easier. Therefore, **H1: Using the terminology of Resource-based View by CIO results in higher TMT members' Understanding of the role of IT as opposed to technical jargon.**

Capability-based View and its Terminology

The Capability-based view can be found in theories of Core Competencies (Hamel & Prahalad, 1990) and Dynamic Capability (Teece & Pisano, 1994; Pavlou & El Sawy, 2011). The former was suggested as an answer to the debate on why Japanese corporations are performing better than American or European counterparts in 70s. Core competency is defined as "a skill or combination of skills required to achieve a competitive advantage, which provides value through end products" (Dawson, 1991: p. 1). Three criteria has been suggested by Hamel and Prahalad (1990) to identify core competency: a) providing potential access to a wide variety of markets, b) establishing a significant contribution to the perceived customer benefits of the end product, and c) being difficult to imitate by competitors.

Dynamic Capability, however, is suggested as an extension to RBV (Baker et al., 2011) to resolve the issues with RBV including its ambiguous definition by distinguishing resources from capabilities (Lockett et al., 2009). Dynamic capability is defined as the ability to integrate, build, and reconfigure internal and external operational capabilities to address rapidly-changing environments (Teece et al., 1997). It includes capabilities like sensing the environment, learning, coordinating, and integrating (Pavlou & El-Sawy, 2011). According to this theory, the VIRN-ness of operational capabilities is obtained through dynamic capabilities.

In both these theories, the unit of analysis is the capability instead of the resource. While RBV attributes rent-creation to smart resource-picking, CBV attributes it to capability-building (Makadok, 2001). However, these theories share VIRN-ness and other resource attributes applied by RBV (Kraaijenbrink et al., 2010). Therefore, the only difference in terminology is replacing resource with capability. Grant (1991) defined capability as the capacity for a team of resources (i.e. production factors) such as skills, patents, and capital equipment to perform some task or activity. Wade and Hulland (2004) defined capability as a repeatable pattern of actions in the use of resources to create, produce, or offer goods or services to a market or another internal unit. However, in our opinion, Homann (2006) provides a deeper clarification of the nature of Business Capability. According to him, capabilities are what the business does (e.g. pay employee or ship product) regardless of what resources being used or how those resources are configured (e.g. whether it is in-sourced or outsourced, or manual or automated). In fact, business processes describe how a capability is materialized in terms of the sequence of activities and the resources being used in each activity. Moreover, in his opinion, capabilities are more objective than business processes as they are expected to perform at a certain level expressed in units per period of time or some quality measurement e.g. fulfilling 10 thousands orders per day or being very fast in stocking hot items for customers to buy (Austin et al., 2009).

Since a significant number of researchers have used CBV to discuss strategies and competitive advantages, it is reasonable that CIOs adopt the terminology of CBV to speak to TMT. Therefore, CIOs are recommended to speak about the VIRN-ness of the business capabilities created by the IT resource instead of speaking about the VIRN-ness of the IT resource itself. Take the previous example of the role of big data and Hadoop in an organization. A CIO can claim:

> Hadoop is a new technology. [Capability:] Hadoop enables predicting unknown from known. We can predict our competitors' price for an item using the existing market statistics. We can also predict maximum price customers are willing to pay for the same item. These enable competitive pricing. [Value:] Competitive pricing increases our revenue by having the highest prices for our products without customers leaving us for competitors. [Rarity:] As far as I know, at the moment, none of our competitors are working on enhancing competitive pricing. However, in a recent CIO conference, I noticed that a couple of our competitors like X and Y have started planning on deploying Hadoop that can be applied for the same purpose. [Imitability:] It takes us a year to

> completely be able to materialize competitive pricing. As for our competitors like Z and Y, I assume it takes them a year and a half considering their inability to pay high enough to hire best experts in the market. [Substitutability:] Our competitors can use market experts to enhance their pricing strategies, but their predictions won't be as accurate as ours. [Value:] Hadoop will cost us up to $200K per year.

Since the CBV terminology consists of words whose corresponding nodes are well-established in TMT members' memory, the claims that use this terminology can be verified faster than claims that use technical jargons. Therefore, TMT members can appreciate the role of IT resources easier. Therefore, **H2: Using the terminology of Capability-based View by CIO results in higher TMT members' Understanding of the role of IT as opposed to technical jargon.**

Resource-based View (RBV) vs. Capability-based View (CBV)

We believe that speaking in terms of the CBV nomenclature result in a higher IT strategic alignment than speaking in terms of RBV nomenclature based on three reasons: a) capability, as a theoretical concept, empirically explains differences in firms' performance better; b) capability is a more stable concept in the constant-changing business and technological environment, c) capability has a shorter semantic distance from well-established language concepts in TMT's mind. In the following, we explain these reasons in detail.

First, capability is shown to be empirically more powerful in explaining the differences in firms' performance. This can be attributed to the fact that resources are seldom valuable in isolation (Penrose, 1959); but the synergistic combination or bundle of resources that matters (Kraaijenbrink et al., 2010; Teece, 2007; Grant, 1996). In fact, Newbert (2007) found evidence that resource combinations or capabilities are more likely to explain differences in firms' performance as opposed to single resources in isolation. This is because adding a resource to a firm can leave different effects on a firm's performance based on the functionality of the resource in a firm (Lockett et al., 2009). A building or an off-the-shelf software application can be used by different firms and have different degree of effects on the firm performance. Moreover, customers do not care about a firm's resources, but they care about a firm's capability of fulfilling their needs (Lockett et al., 2009). Therefore, speaking in terms of a language concept that is highly correlated with firm performance can be more fruitful for discussing strategies which are, in the end, about increasing the performance of the firms in the long run.

Second, business capability is a more stable concept as opposed to resource. A firm can own the same capability using different resources over time. For instance, the order fulfillment capability has been needed in firms as long as firms exist, though the business process and required resources have changed. Moreover, two firms may also have the same capability to satisfy customers' needs using different resources (Lockett et al., 2009). The fact that capabilities are independent of the business processes that materialize them and are independent of the required resources, make capabilities stable over time. This results in capability-based models being the long-lasting model of the area of focus (Homann, 2006) and makes capabilities suitable to serve as a baseline for strategic planning, change management, and impact analysis to the extent that it is called the Rosetta Stone for business/IT alignment (Ulrich & Rosen, 2011). This is in line with Tallon's (2007) suggestion to researchers that alignment should be viewed, conceptualized, and evaluated at the capability level which helps with fostering a deeper and more meaningful understanding of its effects on firm performance and finding the right type of fit.

To explain our third reason, we leverage on the semantic memory theory. According to Kohli and Grover (2008), the commonly accepted logical progression of IT value is like what illustrated in Figure 2. An IT resource is used to create or enhance one or several business capabilities. The created or enhanced business capabilities contribute to the business value i.e. reducing organizations' costs of operations or increasing organizations' revenues. Therefore, according to the Theory of Semantic Memory, the three language concepts are stored as three nodes with business capability as the intermediate node.

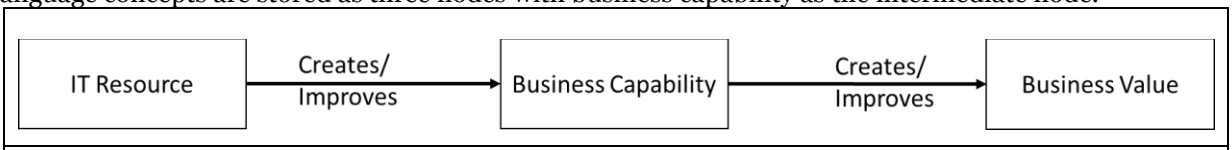

Figure 2: The logical relationship among IT resource, business capability, and business value,

adopted from Kohli and Grover (2008).

In an RBV-based claim, IT-resource (e.g. Hadoop) and business value (e.g. increasing revenue) are mentioned but business capability (e.g. predicting prices) is not mentioned. Therefore, the TMT members need to recall the node. According to Anderson and Bower (1972), they need to retrieve each instance of business capability in their memories and then verify the claim for each instance. However, in a CBV-based claim, the business capability is mentioned, and, thus, the TMT members do not need to search for the proper instance of business capability. They only need to recognize the business capability. Even if the TMT members' recall and recognition process in memory takes same time, due to the longer semantic distance of IT resource from the business value, the verification of the claim takes more time. Therefore, TMT members can appreciate the role of IT resources easier. In this light, we hypothesize that: **H3: Using the terminology of Capability-based View by CIO results in higher TMT members' Understanding of the role of IT as opposed to using the terminology of Resource-based View.**

The role of TMT's IT Competence

"The set of IT-related knowledge and experience that a business manager possesses" is defined as IT competence (Bassellier et al., 2003). Rockart et al. (1996) suggests that success or failure of an organization's use of IT is more dependent on the IT competence of its business managers than effectiveness of its IT organization. Bassellier et al. (2003) identified seven dimensions for IT competence: knowledge of technologies, knowledge of applications, knowledge of system development, knowledge of IT management, access to IT knowledge, experience in IT projects, and experience in management of IT.

It is reasonable that TMT members, who have a higher IT competence, are more aware of various IT resources and the capabilities they make for the firm. Thus, they can have clearer mappings of IT resources and corresponding capabilities in their minds and can have a better judgement of the business value of an IT resource. Therefore, speaking in terms of IT resources to the TMT will be as if speaking to them in terms of the corresponding capabilities. Thus, the benefits of a claim based on CBV terminology diminishes as IT competence of TMT grows. In this light, we hypothesize: **H4: The higher (lower) is the IT competence of the TMT member, the less (more) will be the differences among the effects of the three terminologies on Shared Understanding of the role of IT.**

Methodology

We will test our hypotheses by conducting an experiment. Our target population consists of CMOs (i.e. the most senior marketing manager within the organization who report directly to the CEO) of North American companies. The list of CIOs and their contacts will be obtained from Linkedin and Dun & Bradstreet Million Dollar Database (D&B Database). A link to a web page containing the questionnaire will be sent to the email account of those CMOs. On the web page, the participants will evaluate their IT competence first. Then, they will read:

> "Assume that you've been appointed as the new Chief Marketing Officer of a big company. The CIO just sent you his second email. In part of the email, the CIO explained a new Technology called DataX and asked for your support regarding convincing the CEO to invest in DataX. Please read this part carefully and answer the questions".

Then, they will be randomly assigned to three groups and will see and read either of the three explanations provided in the previous sections about the role of Hadoop: the explanations in technical jargon, in RBV terminology, and in CBV terminology. The name Hadoop will be replaced by DataX so that participants' prior biases toward the big data technology do not confound the results. The constructs of interests are CIO's Language as the independent variable and CMO's understanding of the role of IT as the dependent variable. CMO's IT competence will also be the moderating factor. A simple t-test or ANOVA will be run to evaluate the first three hypotheses. To test the role of the moderating factor, a regression test will be applied. Table 1 summarizes constructs in the questionnaire, their definitions, and measurement items. The questionnaire's items will be validated using card-sorting (Moore & Benbasat, 1991), a pilot study with 30 CMOs, and relevant statistical assessments like Cronbach's alpha in SPSS. We also ask about the characteristics of company (e.g. revenue, No. of employees) and participants (e.g. age,

experience, gender) to check the external validity of our findings. We also have a question for manipulation check.

Table 1: Constructs, Definitions, Measurement Items

Construct	**Definition**	**Items**
CIO's language (Technical, RBV-based, CBV-based)	The terminology being used in a claim by CIO to support investment in an IT resource (Hadoop)	the three different explanations of Hadoop
CMO's Understanding of the Role of IT	The degree to which the CMO understands the role of IT (Hadoop) within the organization.	1) I understand the role of DataX in our company. 2) I understand how DataX creates value for our company. 3) I am able to evaluate the importance of DataX to our company. 4) I can see the role DataX plays in our company. 5) It is clear to me how DataX can help us compete with our rivals.
CMO's IT Competence	The set of IT-related knowledge and experience that a business manager possesses" is defined as IT competence	For each area, please evaluate your level of knowledge or experience (scale b): 1) knowledge of IT infrastructure, 2) knowledge of applications, 3) knowledge of system development, 4) knowledge of IT management, 5) access to IT knowledge, 6) experience in IT projects, and 7) experience in management of IT

Conclusion

Shared language is an important, yet neglected antecedent of Strategic IT alignment. The research question addressed in this study is using what terminology by CIOs results in a higher shared understanding of the role of IT and thus higher Strategic IT alignment. Using the existing literature of strategic management, the terminology of two theories have been suggested: Resource-based View and Capability-based View. We hope to find empirical support that using the terminology of CBV results in higher shared understanding as opposed to the terminology of RBV. The result of this study, when completed, suggests that not only CIOs are better to speak to TMT in terms of CBV nomenclature, but the documents on business strategies are better to be written in terms of the required business capabilities for implementing the strategies. Then the IT strategy document can discuss how those capabilities can be created or enhanced by IT division. Furthermore, the result suggests IS design-science researchers that a design artifact aiming at enhancing the strategic alignment should have a capability-based view. Developing such an artifact can be the focus of future studies.

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